



**CENTRAL INDIANA
LAND TRUST**

SUMMER 2019

THE FUTURE IS OAKEN

**SPECIES SPOTLIGHT
ARACHNID APPEAL:
SAVING SPIDERS
(AND AN ENTIRE ECOSYSTEM)
IN HILLS OF GOLD**

**FOR LOVE OF NATURE:
PLANTING SEEDS
IN YOUNG MINDS**



CENTRAL INDIANA LAND TRUST

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FROM THE LEADERSHIP

Last year, following the advice of a friend, my family spent our summer vacation in Maine. We loved it. So much so, we returned this year, but earlier in the season so we could see the birds that disperse during warmer months. This year we stayed in a wooded area filled with wildflowers and ferns.



Cliff Chapman

We took a boat trip out to see Atlantic puffins and were lucky enough to spot several birds we had never seen before—like razorbills. These are animals we just can't find in Indiana. However, the flowers, ferns and trees we saw around the house and along hiking trails in preserves were more familiar.

Nearly everything we saw growing can be found back home in Indiana.

From the red oak/Eastern hemlock-dominated forests to blueberry bushes, starflowers and even pink lady slipper orchids—no matter how exotic the vegetation looked, I was able to connect these plants to natural areas in Indiana where they can be found. And not just the plants, but the birds in the trees and butterflies fluttering about: Whether they show up as Indiana residents, winter visitors or migrants, we can find just about every one of these a stone's throw from our home.

This made me think of two things. First, we are truly blessed to live in a state with such incredible biological diversity, and I am honored to work for you to save as much of it as possible. Second, we only understand these connections to far-flung places because of the great scientists who have explored Indiana's natural areas for generations.

Our conservation plan is heavily influenced by the work of past conservationists like Charles Deam, John Potzger, E. Lucy Braun and Alton Lindsey. But our work is also guided by talented scientists today, who work for several partner organizations. I'm thinking of conservation heroes like Mike Homoya, Alice Heikens, Don Ruch, John Shuey, Roger Hedge and John Bacone—all of whom live right here in Central Indiana. We are so lucky to work with them.

This newsletter has a science theme, exploring spiders, botanists and the importance of keeping oaks in our Central Indiana forests. I hope our work today, protecting and managing our highest quality natural areas in the central third of Indiana, will inspire tomorrow's scientists to keep exploring. We may not have the puffins you can find in Maine, but we have far more species that do make Indiana their home. Let's keep it that way.

Cliff Chapman
Executive Director

ON THE COVER:

Future naturalist from Girls, Inc.
Photo by Mary Ellen Lennon





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THE FUTURE IS OAKEN

At a recent CILTI board retreat, board members toured Glacier's End, where we have planted oak saplings (shown here in deer-proof enclosure). Photo by Dick Miller.

Who doesn't love the grandeur and beauty of an elder oak tree? Anyone who takes to the trails at a preserve like Meltzer Woods will feel the hush of walking under them. It seems nearly impossible for any nature lover to come into their presence and not feel stirred at a profound level.

But the power of these trees runs much deeper than our emotional connection to them.

For starters, entomologist Doug Tallamy has famously noted that oak trees provide food and habitat for 534 species of moth and butterfly—the most of any plant genus.

"Oaks are the quintessential wildlife plants: No other plant genus supports more species of Lepidoptera [moths, butterflies and skippers], thus providing more types of bird food, than the mighty oak," Tallamy writes in *Bringing Nature Home: How You Can Sustain Wildlife with Native Plants*.

Many other insect species feed on oak leaves, including leaf beetles, treehoppers and the larvae of gall wasps.

It's simple math: More insects feasting on a tree equals more birds enjoying a buggy bonanza. Meanwhile acorns provide a key food source for flying squirrels, turkeys and wood ducks, among others.

Cavities in the trunks of giant oaks shelter the nests of dozens of bird species, as small as chickadees and as large as barred owls.

These reasons alone make the oak a vital part of the landscape.

Beyond all that, climate change modeling suggests that oaks will be resilient in the face of a changing climate. Maple trees will likely struggle in the warmer conditions of the future, and unfortunately, invasive species are expected to thrive.

But our native oaks stand a good chance at survival.



Meltzer Woods

TREE PLANTINGS

That's one more reason why our recent and planned tree plantings at preserves like Glacier's End and Meltzer Woods have been

heavily slanted to the *Quercus* (oak) genus. With our eyes on a resilient future, we look 300 years down the road and envision a healthy oak-dominated forest that mirrors the natural progression of forest maturation.

In the case of Meltzer Woods (Shelby County), many old growth oaks have fallen as they came to the end of their natural life cycle. Purdue University ecology professor Alton Lindsey noted their size

in his 1969 book *Natural Areas in Indiana and their Preservation*. He noted huge white oaks in the woods there, the last of which were lost about 20 years ago.

With the tree planting in a former farm field adjacent to the woods, the forest should be able to come full circle, maintaining oak dominance in the canopy over the next three centuries.

Planting may not be enough when it comes to the Hills of Gold conservation area in Johnson County. At the Laura Hare Preserve at Blossom Hollow and Glacier's End Nature Preserve, portions of the property are degrading in terms of wildlife food and habitat. At these sites, we're studying two management techniques to help give oaks a fair shot at thriving.

PREScribed BURNS

The first is fire. A fire-dependent genus, oaks' thick bark and deep roots allow them to survive fires that knock back competitors like maples. Fire was a more common occurrence in the Midwest in the past. As fire suppression became widespread practice, oaks began to struggle to grow to maturity.

Why? Faster-growing sugar maples shade them out.

Sugar maples can live 50 years in the understory, waiting for a gap to open up so they can grow upward in the light. But an oak can only survive for about 10 years in deep shade.

If fire sweeps through once or twice a decade, it restricts the spread of maple trees and opens gaps in the forest canopy. A new generation of oaks can spring up.

That's why prescribed burns, as we plan to conduct at Blossom Hollow, are so critical to managing land for future resilience. We have begun a five-year study in a small portion of the preserve to assess the impact of fire—not just on trees, but on all plants found there.

MICRO-OPENINGS

Burning is one possible way to keep oak on the landscape long-term. Another is by cutting openings in the canopy. In the natural resources field, some advocate clear-cutting to enable oaks to regenerate. At Glacier's End, we've begun another experiment to test a lower-impact way of encouraging oak saplings to return to dominance.

Instead of clearing 20 acres as some recommend, we created micro-openings in the forest. In these openings, measuring 1/50th of an acre, we planted oaks.

WE MUST INTERVENE
IN SERVICE OF OUR
FORESTS AND THE
MIGHTY OAK, SO
OUR CHILDREN'S
GRANDCHILDREN
CAN WALK UNDER ITS
MAGNIFICENT CANOPY.



Across all our properties, we have about 11 varieties of oak: white oak, swamp white oak, burr oak, chinquapin oak, pin oak, shingle oak, chestnut oak, Shumard's red oak, northern red oak, black oak and scarlet oak.

We speculate that small openings like these could mimic the canopy gap created by the fall of a big tree. Will it work? We'll be monitoring the site over a five-year period and sharing results widely with the conservation community.

This experiment necessarily required cutting small openings chosen by dominance of invasive species. In this low-quality area within a mostly high-quality preserve, there were dense areas of autumn olive. We cut these down, and also cut or girdled some native pioneer species like sassafras and tulip poplar. A few decent-sized tulip trees were killed as part of

the experiment. (Incidentally, tulip trees rank much lower than oaks as a wildlife food source. Tulips support 21 butterfly and moth species.) While we don't particularly relish destroying a tree of any kind, this sacrifice-for-science will potentially enable young oaks to flourish at this site and beyond.

MANAGING FOR A MIX

So, with all this slashing and burning, are we declaring war on maples and tulips? Of course not. Our goal is to save as many species native to our region as humanly possible. Where maples would thrive in an untouched setting—typically on north-facing slopes, where the soil is wetter—it makes sense to let them proliferate. And keeping a diversity of trees in a forest is desirable. We always manage for a mix of native species, rather than a monoculture.

What we do know is that if we do nothing, the forests will end up maple-dominated, with potentially devastating long-range impact as climate change intensifies. Given the fragmented state of our wild lands today, we must intervene in service of our forests and the mighty oak, so our children's grandchildren can walk under its magnificent canopy.

THE OAK & THE BUTTERFLY

Our tree planting at Meltzer Woods is heavily oak-slanted, with an eye toward the oak-dominated forest of the future. We sowed Virginia wild rye among the saplings to disguise them from deer and give them a chance to grow.

We also planted an immediate gift for monarch butterflies.

Realizing that our young planting at Meltzer will remain fairly open for the first quarter-century or so, we included flowering plants among the saplings as a food source for monarchs and other pollinators.

The monarch habitat consists of common milkweed, butterflyweed, purple coneflower, foxglove beardtongue and New England aster.



Oak sapling with Virginia wild rye

Monarch on Butterflyweed



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GROWING A FOUNDATION TOGETHER

Oaks lay a deep foundation before growing upwards. In fact, for the first three years after planting, their energy goes into their roots. The fourth year is when they begin to grow toward the sky.

From this deep foundation within the soil, these trees will grow to support hundreds of species of butterflies and moths. Lepidoptera species pollinate flowering plants, but they have another key role as well: In caterpillar form they represent a vital nutrient source for nestling birds.

Your ongoing support is critical in giving Central Indiana's best natural areas a chance to grow into their full grandeur. Just as an oak arises from its foundational root system to support countless species, your legacy is the protection of the ecosystem.

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The following state employee donors were omitted from our Spring 2019 Newsletter and Annual Report. We wanted to take this opportunity to recognize their generous contributions during fiscal year 2018. Thank you for supporting CILTI!

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Alice Heikens with cancer root, Blossom Hollow
Photo by Norm Heikens

FOR LOVE OF NATURE: PLANTING SEEDS IN YOUNG MINDS

Botanist Alice Heikens, who's spent 28 years expanding the minds of young people, is a nature lover. That's the root from which her work stems.

From the first time she walked into a life sciences course in college, she knew her calling had something to do with nature. She'd always wanted to teach, so bringing the two passions together made sense. "My goal now is to share that love of nature with others," she says.

Each year she brings her Franklin College students to the CILTI-owned Laura Hare Preserve at Blossom Hollow in Johnson County. It's a place she also seeks out on her own for spiritual sustenance.

Blossom Hollow's mature trees, biodiversity and relative seclusion make it a standout location for both research and rejuvenation. The diverse plant species support an array of wildlife that she's spotted with her students, from Eastern box turtles to bald eagles to foxes—as well as many migratory and nesting birds that need forest interior habitat to thrive.

In a very real way, this property serves as a living laboratory for the next generation of conservationists. Heikens' sophomore-level botany class visits in spring to study wildflowers. Upper-level students investigate plant communities and practice plant identification onsite.

Some students conduct ongoing studies of fascinating species like cancer root (*Conopholis americana*), a parasitic plant that attaches to the roots of oak trees. Over a thousand cancer root plants thrive within a half-acre at Blossom Hollow. The large population testifies to the forest's overall health, because this is a species that does not tolerate disturbance well.

Heikens and her students present their research at statewide and national forums, including the Natural Areas Association annual conference.

But it isn't only college students who benefit from her tutelage. She also captivated 80 young girls enrolled in an afterschool program with Girls, Inc. last spring.

Three groups of girls, ages 5 to 16, explored Blossom Hollow with her as part of a workshop series funded by Indiana Humanities. Most of them had never experienced the natural world, but they eagerly took up her challenge to hunt for mayapple blooms tucked under the canopy of leaves. Notebooks in hand, they followed her into the forest and hung on every word.

How did she hold the attention of these youngsters, most of whom likely spend much more time in front of screens than outdoors? It wasn't hard at all, she says. "When I take students to nature, nature does the talking for me."

Judging from the words the youngest Girls, Inc. participants used to describe how they felt after the outing—"peaceful," "happy," "calm," "joyful"—nature spoke loudly that day.

"MY HOPE FOR THOSE
GIRLS IS THAT WE
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A SEED THAT WILL
GROW IN THEM."

"My hope for those girls is that we planted a seed, a seed that will grow in them," she says.

Who knows? Maybe some of them will grow up with a passion for saving plants in the habitat where they're found, like Heikens.

Some have called her an environmental activist for her focus on endangered species, rare plant communities, and the impact of invasive species. But Heikens prefers to think of herself as an environmental steward. Her research builds a case for the protection of natural areas, helping land managers like CILTI mitigate the impact of climate change on these special places.

And it isn't just academic. It's spiritual. Heikens finds deep refreshment and solace in places like Blossom Hollow.

"For me it's a place to be alone and reflect spiritually," she says. "Oftentimes we just need to be alone and quiet, and that's where I find that God speaks to me most deeply."



Young naturalists in the field with Alice Heikens
Photo by Mary Ellen Lennon



Learning from Alice Heikens at Blossom Hollow
Photo by Mary Ellen Lennon



Glacier's End's rich biodiversity is demonstrated by its diverse spiders.
Photo by Dick Miller.

SPECIES SPOTLIGHT:

ARACHNID APPEAL

SAVING SPIDERS (AND AN ENTIRE ECOSYSTEM) IN HILLS OF GOLD

It's a story older than Miss Muffet: Humans have a long history of fearing spiders. This reaction may reach back to our evolutionary forebears, who survived in part because of that fear.

Yet from a land protection perspective, it's worth celebrating the presence of spiders in natural areas. It's true that arachnids tend not to be photogenic, like many of the species we like to feature. They don't trill birdsong from the treetops or bloom in showy colors like wildflowers do. They may in fact scare us right off our tuffets.

But these creepy-crawlies hold a special niche in the ecosystem.

Ask Marc Milne, assistant professor of biology at University of Indianapolis. He will tell you that spiders can be considered bioindicator species that reveal the overall health of an ecosystem.

Spiders dine on insects and other arthropods, controlling insect populations. In turn, birds and bats dine on spiders, gaining a nutrient boost from this carnivorous critter.

Marc Milne uses an aspirating tube to suck spiders into a vial at Blossom Hollow.





He says it's unclear exactly why Hills of Gold appears so rich in spiders, but he can hazard a few guesses. Due to its hilly terrain, parts of the conservation area have remained forested for thousands of years—its leaf litter could be called “old as the hills.” So the arachnid appeal may lie primarily in the site’s relatively undisturbed terrain.

Also, the area’s unique soil types and particular geology may produce habitats attractive to spiders. And the geology and vegetation likely host a wide variety of insect prey, making it possible for more spiders to proliferate because of the varied food sources.

Milne calls Hills of Gold “the most biodiverse forested area” that he’s seen in Indiana. He’s surveyed Hoosier National Forest, Yellowwood State Forest and Morgan-Monroe State Forest, among others.

His spider-eye view gives him a unique perspective on the importance of conserving natural areas. “Even though some people may not like spiders, they are a critical part of the ecosystem,” he says.

The point of his research is to do the foundational work of knowing what species occupy a particular habitat. “The first basic level of conservation is to know what’s there,” he explains.

He points to the high bird diversity within Hills of Gold, and the presence of species of special concern like worm-eating warblers (which could just as easily be called spider-eating). “Without everything else,” he says, “including spiders and insects, the birds go away. We can’t just work on saving one part of the ecosystem. We have to save the whole thing. Spiders are part of that.”

Anything less would be scary indeed.

In other words, spiders serve as both predator and prey, a key link in the food chain. And they’re particularly abundant, it seems, in our Hills of Gold conservation area.

Milne has been studying sheet-web weaving spiders in this Johnson County site. So far he has identified five formerly undescribed species in the richly biodiverse natural area, which encompasses Glacier’s End Nature Preserve and the Laura Hare Preserve at Blossom Hollow.

The first undescribed species—in the genus *Oreonetides*—created some buzz when Milne discovered it during Glacier’s End’s 2015 bioblitz. In the ensuing years he found three more spider species that were new to science, identified as *Lophomma* n. sp., *Neodietrichia* n. sp. and *Cicurina* n. sp. (The notation “n. sp.” indicates “new species.”)

A fifth discovery was the previously undescribed male of the species *Disembolus corneliae*, which Milne documented in the peer-reviewed international journal *Zootaxa*.

These species have likely been in the region for thousands of years, but were never scientifically documented.

“Most of these critters are tiny, two to three millimeters in size,” he says. That’s about a tenth of an inch. To collect these tiny spiders, Milne sifts leaf litter, lays pitfall traps and uses an aspirating tube to suck individual specimens into a glass vial. He enlists students in this endeavor a few times a year at Hills of Gold, and studies the results in his UIndy lab.

Neodietrichia n. sp. is one of several new-to-science spiders Milne has identified in the Hills of Gold conservation area.
Photo by Marc Milne.





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